AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1-8. (Canceled)

9. (currently amended) A current sensor, comprising:

a magnetic core having at least a first plurality of layers of material having a relatively high magnetic permeability and at least a second plurality of layers of material having a relatively low magnetic permeability ~~abutting~~ arranged proximate said first plurality of layers of material;

wherein said core has a profile with at least one opening therethrough for accepting a current carrying conductor;

wherein said profile is ~~selected from the group consisting of~~ substantially O shaped, substantially C shaped, ~~and~~ substantially figure-eight shaped, or any combination comprising at least one of the foregoing shapes; and

a signal generator that provides an output signal representative of the magnetic flux associated with said current carrying conductor;

wherein said magnetic core exhibits a dynamic range greater than a dynamic range of a similarly shaped magnetic core having only one of said first plurality of layers of material and said second plurality of layers of material.

10. (Original) The current sensor of claim 9, wherein:

said profile is substantially O shaped with at least one leg;

wherein said signal generator is at least one secondary winding arranged about said leg; and

wherein said secondary winding comprises a bobbin having first and second bobbin ends and wire turns arranged on said bobbin.

11. (Original) The current sensor of claim 9, wherein:

said profile is substantially C shaped;

wherein said core comprises spaced opposed gap faces to define an air gap therebetween; and

wherein said signal generator is a magnetic flux sensor arranged within said air gap.

12. (Original) The current sensor of claim 9, wherein:

said profile is substantially figure-eight shaped;

wherein said core comprises spaced opposed gap faces in the central leg of said figure-eight shape to define an air gap therebetween; and

wherein said signal generator is a magnetic flux sensor arranged within said air gap.

13. (currently amended) The current sensor of claim 9, wherein;

said first and said second plurality of layers of material are ~~selected from the group consisting of~~ a NiFe alloy having greater than about 50% Ni, a NiFe alloy having

about 80% Ni, a Co-based amorphous metallic alloy, a CoFe alloy, a CoFe-V alloy, a NiFe alloy having no greater than about 50% Ni, a NiFe alloy having about 50% Ni, an Fe-base amorphous metallic alloy, ~~and~~ a SiFe alloy, or any combination comprising at least one of the foregoing alloys.

14. (currently amended) The current sensor of claim 9, wherein;

said first plurality of layers of material has about 10% more Ni than said second plurality of layers of material.

15. (currently amended) The current sensor of claim 9, wherein;

said first plurality of layers of material has about 20% more Ni than said second plurality of layers of material.

16. (currently amended) The current sensor of claim 9, wherein;

said first plurality of layers of material has about 30% more Ni than said second plurality of layers of material.

17-41. (Canceled)

42. (new) The current sensor of Claim 9, wherein a root-mean-square current sensing accuracy of said magnetic core is equal to or greater than about 98.7% in response to a current in said conductor being at about 0.2X.

43. (new) The current sensor of Claim 9, wherein a root-mean-square current sensing accuracy of said magnetic core is equal to or greater than about 99.7% in response to a current in said conductor being at about 1X.

44. (new) The current sensor of Claim 9, wherein a root-mean-square current sensing accuracy of said magnetic core is greater than about 94% in response to a current in said conductor being at about 9X.

45. (new) The current sensor of Claim 9, wherein a peak-current sensing accuracy of said magnetic core is equal to or greater than about 90% in response to a current in said conductor being at about 1000X.